Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

tributes the origin of these treeless areas, or so-called "barrens," to fire; since the custom of burning ceased the trees have come in. Later on, in speaking of an undergrowth of cane, which used to be abundant in certain sections but has since almost wholly vanished, he shows that grazing of both cattle and hogs has been widespread and is probably responsible directly or indirectly for the rapid disappearance of the cane. Is it not possible that grazing may be also one of the causes, and an important one, in the forestation of the former treeless areas? Grazing animals, particularly hogs, would cut up the grass sod which had previously interfered with the establishment of oak seedlings, and would trample acorns into the mineral soil, thus favoring germination of tree seed and the encroachment of the forest on the grassland.

SUGGESTIONS FOR COOPERATIVE STUDY OF SOME FEATURES OF CLIMATE AND PLANT GROWTH

A number of years ago (in 1905) the writer began keeping a record of the appearance of the first flowers of various plants, chiefly native and naturalized species. This practice has been continued every year, recording as many species as possible, usually from 100 to 300. The study, begun as a matter of current interest, soon developed the idea of determining the average date for each species, and after several years, data had accumulated which seemed worth placing upon record. The results of five years' observations in northeastern Kansas have been published (Am. Mid. Nat., Vol. 5), and those of eleven years in North Dakota are being prepared for similar publication.

The nature of the data at once suggested a comparison of the two localities which lie in the same longitude and formation, separated by seven degrees of latitude. The possibility of determining the heat requirement became a question for further investigation. A preliminary study of this last point has been made by computing the sums of daily mean temperature in excess of 40° F. for the second locality. These results show a considerable variation for the same plants in different seasons, with corresponding variations for different species. By this method the soft maple shows at Fargo a variation of from 2° (1915) to 124° (1911); the white elm 50° to 132° for the same years.

Such a compilation and various observations emphasize strongly the necessity of standardized data as well as proper methods of computation. The data referred to are likely to be unreliable for careful study on account of observational errors such as: frequency and extent of field trips, variation in individual plants, exposure, moisture, etc. A comparison of the annual lists frequently shows an absence of some common plant. Evidently it would be desirable to prepare a short list of species which flowers at different times and endeavor to secure for each of these the data for each year.

These should be, as far as possible, plants which naturally fall within the bounds of daily observation. In case of perennials the same plant should be used for successive years if possible, and of annuals the same location.

For comparison of different localities, data gathered during the same season may be desired, thus requiring cooperative work of several observers. The plants selected would naturally be those of wide geographical distribution, and here we are likely to meet the question of geographical races of a species, or of closely related forms which may be confused. Exchange of seed of the annuals and cuttings of perennials would be desirable. Annuals of common cultivation form a rather distinct group. The time of first flower may be determined very closely by use of the dehiscence of the anther sac, but that of full flower, maturity, etc., offers greater difficulty.

Accurate and complete meteorological data are of course essential. Livingston has suggested the use of the physiological temperature coefficient for the mean daily temperature, but why that of the daily mean? Is it not probable that a more detailed study of the thermograph record is necessary to bring out important relations? Data of soil moisture and snow cover are likely to be found deficient.

It has been suggested recently that the work of Garner and Allard on length of day and night opens a new field of work, but it is difficult to see how this will be applied to plants under natural conditions. From stations at different altitudes (as for instance the work of Sampson, U. S. Dept. Agr. Bull. 700) very different conditions are obtained with similar sunshine. With different latitudes, variations in the other factors also are encountered. Both duration and intensity of sunshine were considered by former workers, notably Marie-Davy.

This brief sketch endeavors to bring out a number of points which should be taken into consideration for further work in this line. The somewhat detailed introduction has seemed necessary to explain the writer's position, and may be useful to others who have not had this particular objective in view. While it may not be deemed advisable to attempt an extensive cooperative project it is hoped that some advance may be made in the value of observations.

A. O. STEVENS

AGRICULTURAL COLLEGE, NORTH DAKOTA

EVAPORIMETERS

In the Monthly Weather Review for May, 1919, I described an attempt to develop an evaporimeter or atmometer possessing more sturdy features than the instruments previously available, simple in its operation, susceptible to use under all weather conditions and at all seasons, and embodying a principle of construction which would insure an integration of the several external factors influencing evaporation in a manner more nearly corre-